

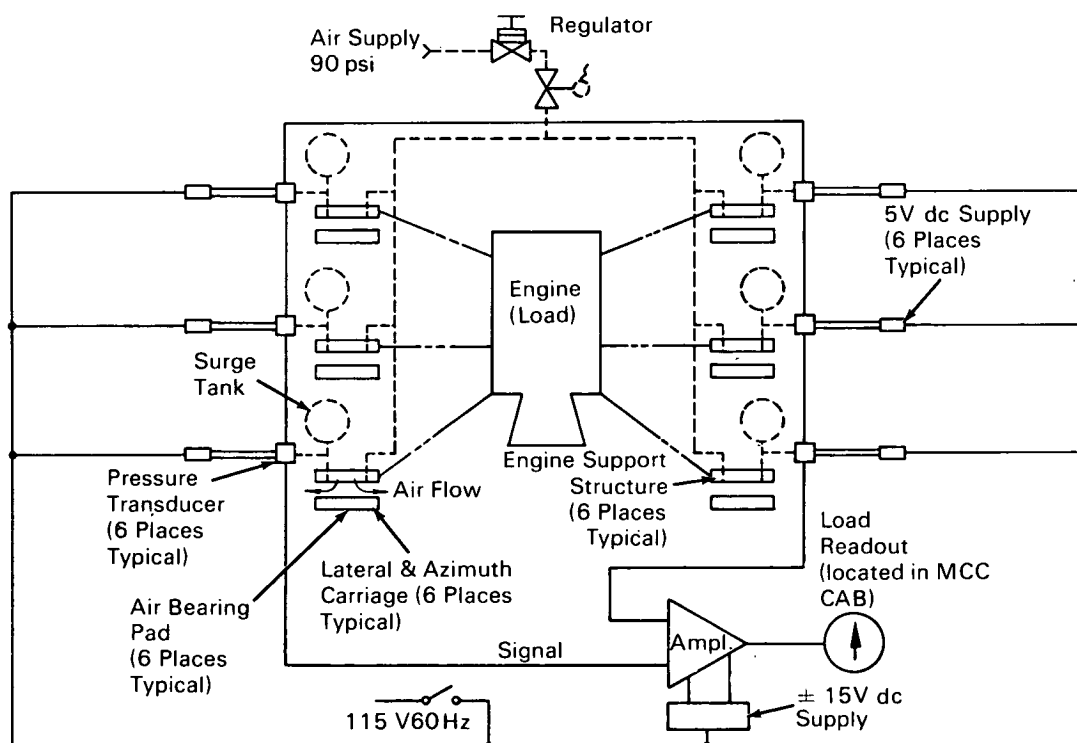
AEC-NASA TECH BRIEF

Space Nuclear Systems Office



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Prevention of Damage to Delicate Connectors During Mounting of Heavy Engines for Testing



Layout of the Mounting System; Schematic

The problem:

A means of controlling the forces to prevent damage between the electrical and mechanical connectors joining a large engine system (about 18,160 kg, or 40,000 lb) to a test stand during remote mating.

The solution:

Use of an air-bearing-pad principle to provide a cushion between the engine and the test stand, and of a system for monitoring of the air-bearing force.

How it's done:

The engine is floated on a "lateral and azimuth (LA) carriage," by use of six commercially available air-bearing pads (see fig.), at a fixed total pressure. The combination of LA carriage and floating engine is raised mechanically until the engine's connectors mate with those of the test stand. A pressure transducer is associated with each air pad; the transducers' outputs are connected in series to an operational amplifier that drives a load-readout meter.

(continued overleaf)

While the engine is floating on the carriage, but before their elevation, the meter shows a reading that is only proportional to the weight of the engine. When the entire assembly is raised, the reading increases as the forces of the connectors between engine and test stand are registered. By prior calibration (with weights) one can establish safe connector-force limits.

Mechanical lowering of the assembly results in uncoupling of the connectors that is indicated by a drop in readout, from the force of engine plus connectors, down to the force of engine suspension alone. If any air bearing ceases to function, limit switches mounted in the system sense a misalignment and stop the operation. The pressure range of each air-bearing transducer is from 0 to 446 kN/m² (0 to 50 psig); each is accurate within 107 kN/m² (0.75 psig) full scale.

Note:

No further documentation is available. Specific questions, however, may be directed to:

Technology Utilization Officer
AEC-NASA Space Nuclear
Systems Office

U.S. Atomic Energy Commission
Washington, D.C. 20545

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Patent status:

No patent action is contemplated by AEC or NASA.

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